

WEATHER, FORECASTS, AND WARNINGS.

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NORTHERN HEMISPHERE PRESSURE.

Alaska.—Pressure averaged decidedly above the normal. The principal lows of the month occurred about the 1st, 20th, 22d–23d, and last day of the month; and high crests occurred about the 3d, 6th, 18th–19th, 24th–25th, 27th, and 28th–29th.

Honolulu.—Pressure averaged slightly below normal. Lows occurred on the 3d–4th, 7th–8th, 9th–10th, 11th–12th, 17th–18th, and pressure was below normal from the 25th to the end of the month. The only highs of the month occurred on the 6th, 14th–15th, and 23d.

Iceland.—Pressure averaged above normal, being almost continuously so during the first half of the month and below during the second half. Lows occurred on the 13th, 16th, 20th, 22d, 24th–25th, 27th, and 30th–31st; and highs on the 1st, 5th, 9th–10th, 11th–12th, 14th–15th, 17th–18th, and 23d.

Azores.—The pressure for the month was decidedly below the seasonal average, being continuously so from the 6th to 18th and from the 25th to the end of the month. Lows occurred on the 6th, 8th–9th, 11th–12th, 14th, 15th–16th, 25th, 27th, and 29th–30th; and highs on the 4th, 21st, and 23d.

Siberia.—Over western Siberia pressure was almost continuously below the seasonal average, while over the eastern portion it averaged slightly above. Lows occurred about the 4th, 10th, 14th, and 29th; and highs about the 1st–2d, 6th, 12th, 17th, and from the 22d to the 28th.

WEATHER IN THE UNITED STATES.

In the United States the month opened with low pressure prevailing from the Middle Atlantic States to the upper Lake region, while from the northern Plateau region to the East Gulf States high pressure obtained.

The disturbance over the Middle Atlantic States which was of minor intensity on the 1st had deepened by the morning of the 2d. Storm warnings were ordered on that date from Norfolk to Eastport and continued for that region on the following day. On the morning of the 3d, the disturbance had moved to a position near Nantucket in which vicinity it remained until the 5th, causing high winds along the middle and north Atlantic coasts. This storm, together with another of slight intensity that moved from western Ontario on the 1st to Lake Huron on the 2d, caused precipitation over the Lake region, the upper Ohio Valley, and the Atlantic States from North Carolina northward.

The western high-pressure area that on the morning of the 1st was central over the northern Plateau region, advanced southeastward, and by the morning of the 3d was over the middle Mississippi Valley with decreased intensity. It thence moved northeastward slowly, and on the morning of the 5th dominated weather conditions throughout the Atlantic seaboard, persisting over New England until the 9th.

On the morning of the 2d pressure was low over Saskatchewan, and by the following morning the low center was over the northern Plains States with other ill-defined centers over northern California and southern Arizona. On the morning of the 4th, pressure was low from the

middle Plains States westward to Nevada, the main center being over Nebraska. During the succeeding two days an offshoot from this storm passed northeastward into Canada, causing brisk to high winds on Lake Superior, for a portion of which warnings were previously issued. On the morning of the 6th the main center was over northern Kansas and during the next 24 hours lost its identity. Precipitation occurred over the southern and central Rocky Mountain region, the Plains and west Gulf States.

On the evening of the 6th there were some indications of a disturbance off the Carolina coast, and advices were accordingly disseminated to ports along the Atlantic coast. By the morning of the 7th pressure had fallen slightly, and further advices were issued to coast cities to the effect that high shifting winds were to be expected off the Carolina and Georgia coasts. By the morning of the 8th the pressure at Charleston had fallen to 29.66 inches, wind northwest, 34 miles an hour, and during the next 12 hours the disturbance passed inland north of Charleston. The storm decreased in intensity and remained over the South Atlantic States until the 12th as a very weak disturbance. It then moved northward to a position off Nova Scotia by the morning of the 13th. This storm regressed slightly to a position off Nantucket and remained off the New England coast until the evening of the 16th, causing storm winds on the Atlantic coast from New York northward, warnings for which were disseminated on the 14th. Precipitation occurred in connection with this storm throughout the Atlantic States.

The following extracts are taken from the report of the Weather Bureau official at Charleston, S. C., regarding this storm:

The storm center evidently moved inland just south of Georgetown, S. C., about noon of the 8th. The best obtainable description of the storm at that place is taken from the log of the U. S. dredge, *Winyah Bay*, which was in Georgetown Harbor. The weather changes there noted are corroborated in less complete reports by the storm warning displayman at South Island and Georgetown. A synopsis of the report furnished by Capt. DeWitt C. Conklin of the dredge is given below:

Tuesday, October 7.—Fresh north to strong northwest wind, hauling to north again during the afternoon. Barometer 29.86 at 7 a. m., and falling during the day.

Wednesday, October 8.—Barometer, 7 a. m., 29.35; 8 a. m., 29.29 and unsteady, ranging from 29.29 to 29.35. Strong northerly gales and violent squalls with heavy rain. About 10 a. m., wind moderated and weather improved. Wind hauling to northeast. Toward noon wind moderated to light breeze hauling more to the east. During the afternoon wind increased to fresh gale from southeast with squalls, rain and slowly rising barometer.

Thursday, October 9.—At 10 a. m., barometer 29.75; 5 p. m., 29.75, remaining about same all day. Fresh gales from south-southeast and heavy squalls with heavy rain, breaking away about noon and wind moderating. Weather cloudy during afternoon and light squalls with rain about 5 p. m., wind having hauled to southeast to south.

By comparison with the morning weather map of October 7, it is roughly estimated that the barometer used by Capt. Conklin gave readings about 0.10 inch too low.

At Charleston the wind shifted in the opposite direction. It was highest during the morning of the 8th and held northwest until about noon, then went west till about 3.30 p. m., southwest until about 11 p. m., then south. During the early morning the wind increased to a maximum velocity of 37 miles from the northwest at about 9.30, subsequently diminishing very gradually to velocities below 25 miles an hour after 5 p. m. With the shift to south, it again increased in velocity, reaching a maximum of 34 miles shortly after midnight of the 8th. The lowest barometer reading was 29.58 inches at 2 p. m. However, if we eliminate the effect of the regular diurnal variation, it appears that the lowest pressure due to the storm occurred about 11 a. m. to 1 p. m.

Torrential rains accompanied the storm, the total amount at Charleston on the 8th and 9th being 4.48 inches, and reports indicate that amounts were greater farther north.

There was practically no damage either at Georgetown or Charleston, or, so far as reports indicate, at any point. The storm warnings disseminated on the 7th enabled owners of floating property to take the necessary precautions. Owing to failure of telegraph and telephone wires, the hurricane warnings were not received at Georgetown.

From the 1st to the 5th pressure on the north Pacific coast was above normal. On the morning of the 6th an offshoot from the high over the ocean was central over Nevada, which during the succeeding 24 hours passed eastward to Colorado, causing heavy frosts throughout that State and the northern portion of New Mexico, warnings for which had been previously issued. During the following 24 hours the high decreased and lost its identity.

Pressure conditions in the Rocky Mountain region remained unsettled, with showers from the 7th to the 9th, but on the morning of the latter date there was a low center over Wyoming. By the following morning it had advanced to Manitoba with increased intensity, and during the 48 hours following passed east-northeastward into Canada. On the 10th storm warnings were ordered for the Lower Lakes and later verified by the occurrence of high westerly winds. During the afternoon of the 11th severe local storms occurred in portions of Wisconsin.

A high-pressure area that appeared on the North Pacific coast on the evening of the 9th was central on the following morning over southeastern Oregon. It passed thence southeastward during the next two days to the West Gulf States, causing frosts over portions of Utah, Colorado, and the southern Plains States, most of which were covered by warnings. By the morning of the 13th it was over Indiana, frosts being reported quite generally through the Upper Lake Region, warnings for a portion of which were previously disseminated. By the following morning it was over the Appalachian Mountains and frosts were reported over that region and portions of the Upper Ohio Valley and Lower Lakes, warnings having been previously issued. The high then settled southward over the East Gulf States during the next two days.

The next disturbance to cross the country appeared over Alberta on the morning of the 13th and was of marked intensity. It passed to western Ontario by the evening of the 14th and thereafter decreased in intensity. This storm gave practically no precipitation. It was followed by a high-pressure area that made its appearance on the 14th over the Middle Pacific coast. In 24

hours it had passed to the northern Plains States and thence to northern Minnesota by the morning of the 16th.

During the 16th a disturbance developed over the West Gulf States and on the evening of that date was central over western Arkansas. It thence moved northeastward and by the morning of the 18th was over eastern Ontario with increased intensity, having caused brisk winds on Lake Ontario for which warnings had been issued. During the 24 hours following it passed northeastward into Canada.

It was followed by a high-pressure area that made its appearance on the North Pacific coast on the morning of the 16th, advancing to the southern Plains States by the 18th and to eastern Ontario by the 19th, and passing thence east-northeastward into Canada. It caused frosts in portions of the Lake region, Upper Mississippi Valley, and southern Plains States, most of which were previously covered by warnings.

Following the rapid advance of the high northeastward during the 18th and 19th, a disturbance developed over the South Atlantic and East Gulf States and was central on the morning of the latter date over extreme northwestern South Carolina, with lowest pressure reading 29.84 inches. Pressure fell rapidly within its area and on the following morning it was central over western Lake Ontario, with lowest pressure reading 29.28 inches at Buffalo. During the next 24 hours it passed to the mouth of the St. Lawrence and in the succeeding 24 hours beyond the region of observations. Storm warnings were ordered on the 19th, during the afternoon for the Atlantic coast from Hatteras to Boston, and on the evening of that date for the remainder of the New England coast and for the Lower Lakes. On the 20th warnings were extended so as to cover the South Atlantic coast, and continued on the Middle Atlantic and New England coasts. Gales occurred over the lower Lakes and along the entire Atlantic seaboard, some damage being reported to shipping. Precipitation was general from the Mississippi Valley eastward, with snow over the western portions of this area. It was followed by a high-pressure area that first appeared on the north Pacific coast on the 18th and during the next 48 hours covered the Plains and West Gulf States, one center being over the northern Plains States and another over the West Gulf. Frosts were reported on the morning of the 20th over northern Texas, Oklahoma, Missouri, and portions of Nebraska and Kansas. On the morning of the 21st the main center was over the East Gulf coast and frosts were reported generally throughout the Gulf and South Atlantic States, except Florida, and also in portions of Iowa, Indiana, Illinois, Ohio, and Tennessee, warnings for which had been previously issued. On the morning of the 22d the high had increased in intensity and was central over Virginia, heavy to killing frosts being reported in the Atlantic States, warnings for which had been disseminated on the preceding day. During the next 24 hours it passed to the Canadian Maritime Provinces, with further increased intensity.

On the evening of the 20th a low-pressure area was over Saskatchewan, which during the following 36 hours moved south-southeastward to the West Gulf States. By the morning of the 23d it was over the Middle Gulf States. During the two days following it passed eastward and northeastward across the Northern Gulf States and was central on the morning of the 25th over Virginia. It thence passed slowly northeastward up the coast and on the morning of the 27th was central southeast of Nova

Scotia. It caused precipitation over the Southern Plains and West Gulf States and over the region from the Mississippi Valley eastward. In connection with this storm a 24-hour fall of rain amounting to 12.18 was reported at Galveston, Tex.

On the morning of the 24th a low-pressure area of moderate intensity was central over Wyoming which, 36 hours later, had assumed a narrow trough formation extending from Lake Michigan to the Texas coast. On the morning of the 27th the main center was over western Tennessee, which during the next 24 hours had passed to eastern Ontario and by the morning of the 29th to the Canadian Maritime Provinces. Warnings of brisk and probably high northerly winds were issued for the West Gulf coast on the evening of the 25th and later verified. Precipitation was general through the West Gulf States and from the Mississippi Valley eastward, except along the immediate Middle and South Atlantic coasts. This disturbance was followed by a high-pressure area that was central on the morning of the 25th over British Columbia, with maximum pressure reading 30.62 inches. During the next 24 hours it had advanced to southern Wyoming and by the 27th to Texas with greatly decreased intensity, a tongue of high pressure extending from the last-named region north-northeastward to Lake Superior. Frosts were reported that morning in portions of Kansas, Oklahoma, New Mexico, and Texas. On the morning of the 28th the high was over Alabama and frosts were reported throughout the Gulf States. The high thereafter decreased in intensity and as nearly as can be determined passed off the South Atlantic coast. The greater portion of the frosts referred to were correctly forecast.

Following the passage of this high southeastward over the Rocky Mountain region a low appeared over Alberta on the evening of the 26th and by the morning of the 28th had passed southward to southwestern Oklahoma with a tongue of low pressure extending thence north-northeastward to the Upper Mississippi Valley. On the following morning a low center was over Illinois and on the morning of the 30th over Nova Scotia. During the 24 hours following it passed to the Grand Banks with greatly increased intensity. Precipitation was confined to the Lake region, Middle and Upper Mississippi Valley, and portions of New England. Following its passage, the most pronounced high area of the season appeared over Saskatchewan on the 28th, accompanied by temperatures below zero. By the following morning the high area extended from eastern North Dakota to the Texas Panhandle. On the morning of the 30th the high center was over the Northern Plains States and killing frosts were reported in the Middle and West Gulf States. During the next 24 hours it had passed to the Middle Mississippi Valley, frosts being reported throughout the Gulf and South Atlantic States. The sweeping changes to colder weather accompanying and preceding this high-pressure area, and the frosts that occurred in connection with it, were for the most part successfully forecast. At points in the Plains States temperatures were 5° to 7° lower than ever before recorded in the month of October.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since Jan. 1.	Average departures since Jan. 1.
New England.....	12	54.8	+4.4	+18.5	+1.8
Middle Atlantic.....	15	57.6	+2.2	+18.3	+1.8
South Atlantic.....	10	63.3	-0.4	+14.7	+1.5
Florida Peninsula ¹	9	71.6	-1.7	+ 7.2	+0.7
East Gulf.....	11	63.1	-2.5	+ 3.7	+0.4
West Gulf.....	11	64.2	-2.4	- 6.7	-0.7
Ohio Valley and Tennessee.....	11	56.6	-0.2	+1.21	+1.2
Lower Lakes.....	11	53.3	+1.7	+ 8.6	+0.9
Upper Lakes.....	13	48.2	+0.5	+ 3.9	+0.4
North Dakota ¹	9	38.8	-4.4	- 3.7	-0.4
Upper Mississippi Valley.....	13	51.3	-1.5	+ 6.7	+0.7
Missouri Valley.....	12	50.2	-2.5	- 0.4	0.0
Northern slope.....	9	41.6	-3.1	-10.8	-1.1
Middle slope.....	6	52.4	-3.2	- 0.4	0.0
Southern slope ¹	8	58.9	-3.3	- 8.7	-0.9
Southern Plateau.....	9	60.8	-0.8	-21.7	-2.2
Middle Plateau ¹	10	46.9	-1.5	- 8.8	-0.9
Northern Plateau ¹	10	45.6	-2.2	-14.5	-1.4
North Pacific.....	1	50.5	-0.6	- 2.0	-0.2
Middle Pacific.....	7	61.1	+2.4	+ 4.2	+0.4
South Pacific.....	4	65.6	+3.3	+12.3	+1.3

¹ Regular Weather Bureau and selected cooperative stations.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal	Current month.	Accumulated since Jan. 1.
New England.....	11	6.08	165	+2.40	-2.80
Middle Atlantic.....	15	4.35	138	+1.20	-1.70
South Atlantic.....	11	3.93	100	0.00	-4.70
Florida Peninsula ¹	9	3.78	76	-1.20	-7.20
East Gulf.....	11	2.39	86	-0.40	+0.90
West Gulf.....	10	5.33	195	+2.60	+2.50
Ohio Valley and Tennessee.....	14	3.15	124	+0.60	+2.10
Lower Lakes.....	10	3.94	134	+1.00	+2.30
Upper Lakes.....	14	3.00	107	+0.20	-1.00
North Dakota ¹	9	1.68	156	+0.60	-3.20
Upper Mississippi Valley.....	13	3.08	124	+0.60	-2.50
Missouri Valley.....	12	2.35	127	+0.50	-4.40
Northern slope.....	9	1.32	143	+0.40	+0.60
Middle slope.....	6	1.59	107	+0.10	-2.70
Southern slope ¹	8	2.53	131	+0.60	-2.70
Southern Plateau ¹	9	0.12	19	-0.50	-1.60
Middle Plateau ¹	11	0.60	67	-0.30	-1.10
Northern Plateau ¹	11	1.55	148	+0.50	-0.20
North Pacific.....	7	3.83	97	-0.10	-4.20
Middle Pacific.....	6	0.26	17	-1.30	-9.50
South Pacific.....	4	T.	0	-0.80	-2.90

¹ Regular Weather Bureau and selected cooperative stations.

Average relative humidity and departure from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England.....	86	+7	Missouri Valley.....	68	+1
Middle Atlantic.....	79	+3	Northern slope.....	68	+8
South Atlantic.....	74	-4	Middle slope.....	67	+8
Florida Peninsula.....	74	-6	Southern slope.....	64	+1
East Gulf.....	76	+3	Southern Plateau.....	42	0
West Gulf.....	77	+5	Middle Plateau.....	48	-1
Ohio Valley and Tennessee.....	75	+4	Northern Plateau.....	63	+6
Lower Lakes.....	79	+5	North Pacific.....	83	+3
Upper Lakes.....	79	+1	Middle Pacific.....	55	-15
North Dakota.....	75	+3	South Pacific.....	58	-12
Upper Mississippi Valley.....	77	+6			

Average cloudiness and departure from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England.....	7.7	+2.3	Missouri Valley.....	5.0	+0.9
Middle Atlantic.....	6.0	+1.2	Northern slope.....	6.0	+1.6
South Atlantic.....	3.9	-0.1	Middle slope.....	4.6	+1.2
Florida Peninsula.....	4.7	0.0	Southern slope.....	4.2	+0.4
East Gulf.....	3.9	0.0	Southern Plateau.....	2.3	+0.1
West Gulf.....	4.6	+0.9	Middle Plateau.....	3.2	-0.1
Ohio Valley and Tennessee.....	5.6	+1.2	Northern Plateau.....	5.8	+1.2
Lower Lakes.....	6.6	+0.7	North Pacific.....	6.8	+0.5
Upper Lakes.....	6.6	+0.6	Middle Pacific.....	2.3	-1.5
North Dakota.....	5.7	+0.5	South Pacific.....	2.4	-0.7
Upper Mississippi Valley.....	5.6	+1.0			

Maximum wind velocity.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Atlanta, Ga.....	20	50	sw.	Nantucket, Mass....	21	60	sw.
Rock Island, R. I....	12	56	nw.	New York, N. Y.....	4	54	n.
Do.....	14	52	nw.	Do.....	14	53	nw.
Do.....	20	50	sw.	Do.....	20	63	sw.
Do.....	21	55	sw.	Do.....	21	50	w.
Buffalo, N. Y.....	11	54	nw.	Norfolk, Va.....	20	60	sw.
Do.....	21	52	w.	North Head, Wash.	10	58	s.
Do.....	28	58	sw.	Do.....	12	66	se.
Cheyenne, Wyo.....	27	50	w.	Oklahoma, Okla.....	28	50	n.
Cleveland, Ohio.....	12	52	w.	Pittsburgh, Pa.....	2	60	nw.
Do.....	20	54	w.	Providence, R. I.....	14	50	n.
Eastport, Me.....	21	51	se.	St. Louis, Mo.....	10	52	s.
Hatteras, N. C.....	20	52	w.	Tatoosh Island, Wash.	25	50	e.
Mount Weather, Va.	11	52	nw.	Trenton, N. J.....	20	52	sw.
Do.....	12	56	nw.				
Do.....	30	53	nw.				